

FIRST HOP REDUNDANCY

Protocols

Hot Standby Router Protocol (HSRP)

Provides default gateway redundancy using one active and one standby router; standardized but licensed by Cisco Systems

Virtual Router Redundancy Protocol (VRRP)

An open-standard alternative to Cisco's HSRP, providing the same functionality

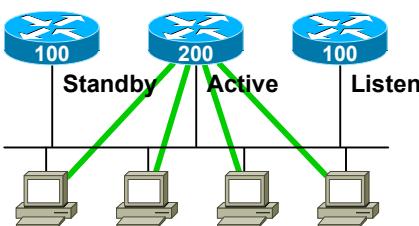
Gateway Load Balancing Protocol (GLBP)

Supports arbitrary load balancing in addition to redundancy across gateways; Cisco proprietary

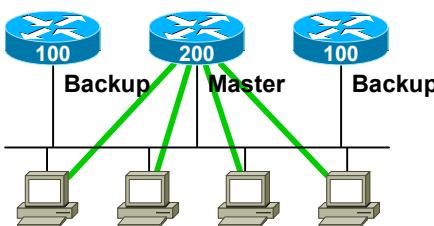
Attributes

	HSRP	VRRP	GLBP
Standard	RFC 2281	RFC 3768	Cisco
Load Balancing	No	No	Yes
IPv6 Support	Yes	No	Yes
Transport	UDP/1985	IP/112	UDP/3222
Default Priority	100	100	100
Default Hello	3 sec	1 sec	3 sec
Multicast Group	224.0.0.2	224.0.0.18	224.0.0.102

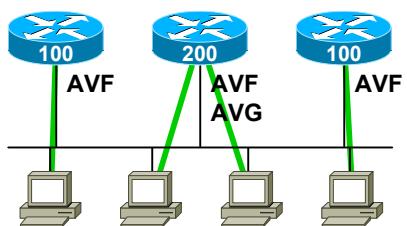
HSRP



VRRP



GLBP



HSRP Configuration

```
interface FastEthernet0/0
ip address 10.0.1.2 255.255.255.0
standby version {1 | 2}
standby 1 ip 10.0.1.1
standby 1 timers <hello> <dead>
standby 1 priority <priority>
standby 1 preempt
standby 1 authentication md5 key-string <password>
standby 1 track <interface> <value>
standby 1 track <object> decrement <value>
```

HSRP/GLBP Interface States

Speak · Gateway election in progress

Active · Active router/VG

Standby · Backup router/VG

Listen · Not the active router/VG

VRRP Interface States

Master · Acting as the virtual router

Backup · All non-master routers

VRRP Configuration

```
interface FastEthernet0/0
ip address 10.0.1.2 255.255.255.0
vrrp 1 ip 10.0.1.1
vrrp 1 timers {advertise <hello> | learn}
vrrp 1 priority <priority>
vrrp 1 preempt
vrrp 1 authentication md5 key-string <password>
vrrp 1 track <object> decrement <value>
```

GLBP Roles

Active Virtual Gateway (AVG)

Answers for the virtual router and assigns virtual MAC addresses to group members

Active Virtual Forwarder (AVF)

All routers which forward traffic for the group

GLBP Load Balancing

Round-Robin (default)

The AVG answers host ARP requests for the virtual router with the next router in the cycle

Host-Dependent

Round-robin cycling is used while a consistent AVF is maintained for each host

Weighted

Determines the proportionate share of hosts handled by each AVF

GLBP Configuration

```
interface FastEthernet0/0
ip address 10.0.1.2 255.255.255.0
glbp 1 ip 10.0.1.1
glbp 1 timers <hello> <dead>
glbp 1 timers redirect <redirect> <time-out>
glbp 1 priority <priority>
glbp 1 preempt
glbp 1 forwarder preempt
glbp 1 authentication md5 key-string <password>
glbp 1 load-balancing <method>
glbp 1 weighting <weight> lower <lower> upper <upper>
glbp 1 weighting track <object> decrement <value>
```

Troubleshooting

show standby [brief]	show vrrp [brief]
show glbp [brief]	show track [brief]